TESTICULAR TERATOMA WITH EXTENSIVE INTRACARDIAC METASTASES

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Patients suffering from malignant disease rarely die as a result of metastatic involvement of the heart, and the following unusual case is, therefore, recorded.

CASE REPORT

The patient, a male aged 24 years, was admitted to hospital on March 14, 1946.

History. On February 22, 1946, he had acute pain in the left loin accompanied by malaise, sweating, headaches, pain in the chest, and cough with a small quantity of grey, watery sputum. On March 10, his urine was noticed to have a dark colour. On March 12, he had an attack of blurred vision lasting one day, his face became swollen, and vomiting commenced. These symptoms were still present on admission to hospital by which time suppression of urine had been present for more than twelve hours.

Examination. The patient was alert, co-operative, and well nourished. Pulse regular, small, rate 116. Temperature 97.2° F. Respiration rate 30. The sclerae were faintly icteric, and there was generalized swelling and cyanosis of the face and neck. Dilated veins were visible bilaterally running from the thoracic inlet down the arms in the region of the delto-pectoral grooves, but no cervical venous dilatation was noticed. The chest was emphysematous. The trachea was central. Respiratory movements were poor but symmetrical on the two sides. A few high-pitched rhonchi were audible, uniformly distributed over the lung fields. The cardiac impulse was impalpable and the area of cardiac dullness reduced. The heart sounds were faint but otherwise normal, and there were no bruits. The liver was firm, smooth, not tender, and its lower border was palpable four fingers' breadth below the costal margin. A firm fixed mass was palpable deep in the left hypochondrium extending down into the left flank and upwards towards the region of the spleen. Localized tenderness was present over a point in the left sacrospinalis two inches above the level of the iliac crest. Slight pitting oedema was present over both ankles. The urine was a dark brown colour, odourless, and acid in reaction, with a specific gravity of 1030; it contained albumin, bile pigments, and urobilin.

On the morning after admission the sclerae were more intensely icteric and a subconjunctival hæmatoma was present in the left eye. Oedema and cyanosis of the head and neck were more intense and a petechial eruption was present over these areas. On the basis of the above findings the patient was considered to have obstruction of both superior and inferior venæ cavæ. Radiographs of the chest showed a pericardial effusion. Paracentesis pericardii was performed and 750 ml. of icteric serous fluid withdrawn. This had little effect on the condition of the patient who was restless and, at times, irrational. On the morning of March 15, he had an exacerbation of dyspnoea and cyanosis lasting about 3 hours. At 5 p.m. on the same day, his symptoms again increased and by 7 p.m. he was severely dyspnoeic and

cyanosed; pulse small, regular, rate 180; respiration 40. Pulsus paradoxus, which had been well marked after paracentesis, was no longer perceptible. The X-ray appearance was unchanged. A further paracentesis was attempted but had to be abandoned on account of the patient becoming severely distressed. His face and neck became almost black from cyanosis, and he died shortly afterwards.

The turbid serous fluid withdrawn from the pericardium contained large deeply staining cells, some of which were binucleate, together with erythrocytes, lymphocytes, and a few polymorphs. It contained 0.8 g. protein per 100 ml. Total leucocytes, 15,000; polymorphs 13,120 per c.mm. Blood van den Bergh gave an immediate direct reaction, with total circulating bilirubin of 5 mg. per 100 ml. Blood W. R. negative. Electrocardiograms showed slight right axis deviation.

Post-mortem Examination

The body of a well-developed, well-nourished muscular young man. The skin showed slight icterus, and the head, neck and upper limbs were livid.

The air passages contained frothy serous fluid. There were 300 ml. of clear fluid in the right pleural cavity and traces of blood-stained fluid in the left. The lungs showed terminal congestion and oedema; no macroscopic deposits of growth were visible.

The pericardium contained about 150 ml. of turbid effusion, and showed fibrinous pericarditis. The heart was enlarged. Both right auricle and ventricle were dilated, and the former appeared, on external examination, to be entirely solid. On opening the heart, the cavity of the right auricle was found to be occupied by a huge cauliflower-like mass of growth which was obstructing the orifices of the superior and inferior venæ cavæ. The growth appeared to spring from the wall of the auricular appendix, the whole thickness of which was infiltrated by growth. The tumour protruded through the tricuspid orifice and a further discrete pedunculated mass sprouted from the wall of the right ventricle (Fig. 1). The myocardium was normal except where infiltrated by growth. The valves were normal.

The liver was enlarged and showed gross venous congestion. The peritoneum was diffusely studded with minute petechial hæmorrhages, and a slight excess of free fluid was present.

A large lobulated mass of growth was present in the lumbar lymphatic glands on the left side. The mass was firmly adherent to the front of the vertebral column and to the left psoas muscle. On section the tumour mass was found to be intersected by bands of fibrous tissue. The cut surface had a variegated appearance suggestive of a solid teratoma, and some compartments of the tumour contained material of a sebaceous consistency. This mass was quite separate from the kidneys and suprarenals. There was a small hydrocele of left tunica vaginalis. The testes were apparently normal on palpation and inspection, but section showed a small nodule 0.5 cm. in diameter in the centre of the body of the left testis.

Histology. Sections of nodules in the testis showed malignant teratoma. The mixed nature of the growth was more apparent in the secondary deposits in lumbar glands and heart (Fig. 2); in the latter much of the growth was necrotic (Fig. 3 and 4).

COMMENT

There was nothing in the patient's history to indicate myocardial failure or the pericardial effusion as the prime cause of the clinical manifestations. They were adequately explained by the necropsy finding of a large tumour arising from the wall of the right auricular appendix and almost completely occluding the auricular cavity.

In order to obstruct the flow of blood from both venæ cavæ, a tumour must almost completely fill the auricle, so that signs of caval obstruction will be unlikely to appear until a short

time before death, as happened in this case. Œdema of the face from obstruction of the superior vena cava was among the early presenting symptoms, while hepatomegaly was not noticed until the patient's admission to hospital. The liver enlarges rapidly in response to back pressure along the inferior vena cava, whereas a longer time is required for anoxia and local nervous mechanisms to produce manifest œdema. It would appear that obstruction of the superior vena cava was present from the onset of the illness, whereas obstruction of the inferior vena cava occurred relatively late, death intervening before there was time for œdema of the lower extremities to develop.

The purely right-sided situation of the lesion explains the relatively mild degree of respiratory distress despite progressive systemic venous congestion and cyanosis. The acute terminal episode was presumably due to impaction of the mobile portion of the growth in the tricuspid orifice producing complete circulatory obstruction, and a temporary or partial obstruction probably caused the sudden transient increase of symptoms twelve hours before death. It is interesting to compare the results of rapidly progressing right auricular obstruction with those of a similar left-sided lesion. Fawcett and Ward (1939) describe a case with ten months' progressive dyspnoea, cough, and præcordial pain, presenting attacks of faintness and dizziness due to a pedunculated tumour of the left auricle. Wainwright (1938) records cases of both left- and right-sided occlusion. Other examples will be found in the list of references given below.

Yater (1931) lists the "ball valve" type among his anatomical classification of heart tumours. Yater (1931), Fishberg (1930), Lisa *et al.* (1941), and Doane and Pressman (1942) all stress the frequency of sudden death, which may be the first indication of the presence of cardiac tumour.

The post-mortem findings suggest that lymphatic spread occurred early to the para-aortic glands around the renal artery. Thence malignant emboli obtained entrance to the venous blood stream via the cisterna chyli and thoracic duct, there being no macroscopic evidence of the invasion of the inferior vena cava or its tributaries, such as was found in cases of blood-borne tumours of the right auricle described by Paget (1855), Kanthak and Pigg (1897), Parkes-Weber (1915), French (1912), and Fry and Shattock (1926).

The intracardiac metastases probably arose by direct implantation of cells in the wall of the right auricular appendix. Evidence for this is as follows—(1) this region of the auricular wall showed maximal infiltration by malignant cells; elsewhere the cauliflower-like mass lay free in the auricular cavity, following the direction of blood flow through the tricuspid orifice and allowing blood to pass between it and the auricular wall; (2) the tendency towards stasis is maximal in this part of the right auricle as shown by the tendency for ante-mortem thrombi to form here in cases of auricular fibrillation; (3) the absence of pulmonary metastases; (4) the absence of arrhythmia indicating that the sino-auricular node and bundle of His were free from infiltration. Pericardial effusion occurring without obvious cause is a frequent manifestation of a tumour of the heart (Yater, 1931).

SUMMARY

A case of extensive intracardiac metastases from a clinically undetectable testicular teratoma is recorded. The clinical picture is discussed in the light of the autopsy findings and with reference to similar reported cases.

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REFERENCES

- Doane, J. C., and Pressman, R. (1942). *Amer. J. med. Sci.*, **203**, 520.
 Fawcett, R. E. M., and Ward, E. M. (1939). *Brit. Heart J.*, **1**, 249.
 Fishberg, A. M. (1930). *Amer. J. med. Sci.*, **180**, 629.
 French, H. (1912). *Trans. med. Soc. Lond.*, **35**, 243.
 Fry, W. J. B., and Shattock, C. E. (1926-7). *Brit. J. Surg.*, **14**, 337.
 Goldstein, H. I. (1922). *N.Y. st. Med. J.*, **115**, 158.
 Hamilton-Paterson, J. L., and Castleden, L. I. M. (1942). *Brit. Heart J.*, **4**, 103.
 Kanthak, A. and Pigg, T. (1897). *Trans. Path. Soc. Lond.*, **48**, 139 and 150.
 Lisa, J. R., Hirschhorn, L., and Hart, C.A. (1941). *Arch. intern. Med.*, **67**, 91.
 Mahaim, I. (1945). *Les Tumeurs et Les Polypes du Cœur*, Paris and Lausanne.
 Morris, L. M. (1927). *Amer. Heart J.*, **3**, 219.
 Paget, J. (1855). *Trans. Roy. Med. Chir. Soc.*, **38**, 247.
 Parkes-Weber, F. (1915). *Proc. Roy. Soc. Med. (Med. Section)*, **8**, 6.
 Schnitker, M. A., and Bailey, O. T. (1937). *J. Amer. med. Ass.*, **108**, 1787.
 Smith, D. S. (1937). *Ibid.*, **109**, 1192.
 Wainwright, C. W. (1938). *Johns Hopk. Hosp. Bull.*, **63**, 187.
 Yater, W. M. (1931). *Arch. intern. Med.*, **48**, 627.

FIG. 1.—Heart with right cavities opened, showing occlusion of right auricle by friable tumour, and discrete nodule of growth springing from wall of right ventricle.

FIG. 2.—Section of lumbar tumour showing epidermal elements. Magnification: $\times 120$.

FIG. 3.—Section of intra-auricular tumour showing extensive areas of necrosis and hæmorrhage. Magnification: $\times 32$.

FIG. 4.—Section of intra-auricular tumour. Magnification: $\times 120$.